BENCHMARKING DIGITAL LEARNING RESOURCES

Draft

Background

The ongoing CERI project on Digital Learning Resources[1] (DLR) includes among its final outputs the delivery of a proposal for a system of indicators that will benchmark the development of DLR. This proposal will come as a result of a standing working group in this area. To facilitate the work of this group, and to initiate the discussion, the following paragraphs review previous attempts, identify the main areas to be covered, provide an initial analytical framework, and outline the methodological approach and the resulting issues to be solved.

Previous attempts

Much work has been done on the statistics of access and use of ICTs in schools, sometimes with an impressive array of details (as in the recent EU report,…). Most of these attempts have emphasised aspects such as quality of access, teacher preparation and time of actual use. Only a few, such as PISA (2005) and Woessman and Fuchs (2004) have tried to connect these parameters with the desired effects on improving the quality of teaching and learning and educational performance.

In the particular domain of DLR in higher education, CERI's previous work on Open Educational Resources had to face a number of problems in mapping their development across countries, and could not provide a safe path to do so. The DLR Project provides a fresh opportunity to review this and to suggest some alternatives for future development.

Objectives

The work on benchmarking DLR is intended to address three particular issues:

- how to map DLR development and use in the schools sectors?

- how could DLR development and use be linked to an improvement of educational quality and performance?

- how to link the two previous questions to national policies or developments, particularly by way of international comparison?

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1. DLR are defined in the context of this project as "any digital resource that is actually used by teachers and learners for the purpose of learning". It was agreed to restrict the work to the schools sector (primary and secondary education).

Analytical framework

Benchmarking the development and use of DLR and their effects on education is not an easy task. It is not as simple as counting the number of available DLR because the final aim of this benchmarking exercise is to analyse the conditions that foster the development and use of these resources and their effects on educational quality and outcomes. Accordingly, what is needed is an approach[2] that considers at the same time the availability or resources and how widespread is their use.

To do so, it could be argued that it is worth looking, first of all, at the conditions that make development possible and, secondly, to the conditions that enable use. But it could be also claimed that both development and use are interdependent, in a circular way: development makes usage possible, but use is likely to incentivize further development. Following this second perspective, it would seem that the basic conditions both for development and use are likely to be found in the four areas depicted in diagram A.

Diagram A. Analytical framework for the benchmarking of DLR
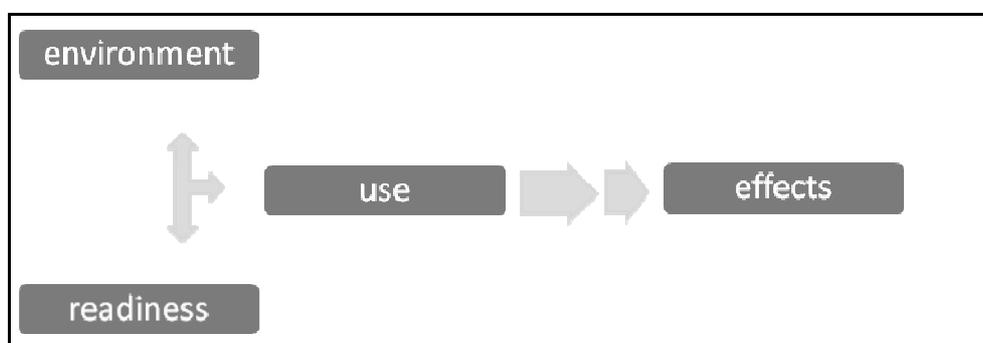
The *environment* can be defined as the technical conditions that enable the development and use of DLR. Some of the most relevant might be:

- *access*: how easy is it to get access to DLR both in schools and at home. This is related to the spread of ICT, equipments and internet connections, in both schools and homes and it can be claimed that the easier the access the better the conditions for DLR development and use.

- *DLR availability*: how many DLR are available to users. This is a crucial aspect, although difficult to measure directly –some indirect measures can, however, be designed (see below).

User readiness is the propensity of users to produce/use DLR. This propensity is linked to the level or ICT-related skills competence showed by teachers and pupils. It can be argued that parents' readiness should be also taken into account because of its direct influence on actual use by pupils.

Both the development of the technological environment and the level of user readiness combine to facilitate the actual use of DLR. Accordingly, *use* refers to the actual application of DLR in teaching and learning activities, both by teachers and pupils, as well as the types of DLR used and for what purposes. It is particularly in the school use of DLR by teachers and pupils where the effects of

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2.   The one used here is broadly inspired in the work done by INSEAD to develop a system of indicators to benchmark countries regarding ICT competitiveness. The resulting index has been published since 2002 by the World Economic Forum yearly, and is known as the *Networked Readiness Index* (more at www.weforum.org).

the wider political and institutional context have to be analysed, particularly in regards to the presence or absence of incentives for use.

Finally, any kind of measurable *effect* of the use of DLR either in the quality or in the output of the teaching and learning processes could be said to be the impact of using DLR. In addition, it could be reasonable to expect that an intensive use of DLR, and of ICT at large, can result also in the learning of competences and skills not accounted for in traditional educational settings. Needless to say, the measure of the effects of using DLR poses the most difficult methodological challenges.

Methodological approach

The analytical approach that has been just described is very demanding in terms of methodology. Although some of the areas have already been investigated thoroughly and there is a lot of data available, others have yet to be explored and are the ones which pose the most dramatic challenges. Therefore, it would be realistic to state that in the areas of use and effects, this benchmarking exercise will produce only some pilot schemes and preliminary data. With this in mind, the following paragraphs explore possible ways to deal with the design of indicators in each of the four areas.

Environment

- *access*: An indicator merging data such as ratios of pupils per computer connected to the Internet, percentage of networked homes and the like can provide a useful quick look but more detailed indicators can also be considered, such as for example separating the values for teachers, pupils and families;

- *DLR availability*: This could be restricted to DLR in the national language (most appropriate for early school years), but even so could only be measured nationally on the basis of proxies such as, for example, the number of DLR available in the top three devoted national websites or the total number of national websites devoted to DLR.

Readiness

Measuring readiness is a difficult task since no available data on this propensity exist (such as the precise answer to the question how ready teachers/pupils are to use/produce DLR). However, to start with it could be somewhat linked to the training or level or competence showed by different groups of users on the basis of already existing data, such as:

- *teachers*: training hours on ICT related competences by teacher or surveys of ICT-related skills and attitudes;

- *pupils*: surveys of ICT-related skills and attitudes (such as PISA data);

- *families*: general population surveys of ICT-related skills and attitudes.

Use and effects

Contrarily to the measure of readiness there are no proxies available for the actual level of use of DLR at a national level, nor for assessing the effects. Therefore, a methodology has to be designed to deal with the indicators in this area, including, for example, different groups of users (teachers, pupils, parents) and places of use (school, home).

In similar situations, where analysts have to deal with data that has not been collected at a national level, the most useful strategy seems to be the use of a combination of proxy measures and of questionnaires[3].

In the context of this project, and considering the time and cost constraints, two possible solutions emerge, and since they are not mutually exclusive, the possibility of developing the two simultaneously has also to be considered as a third one:

- **Strategy 1. Questionnaires to main stakeholders.** This entails the development of a questionnaire addressed to the main stakeholders at a national level like government representatives, teacher associations, parent organisations, webmasters and the like. This can provide a general perspective only, with practically no quantitative information on the use or on the effects –although the responses can also be assessed to generate a benchmark. The positive aspect of this strategy is that it can provide a number of useful insights.

- **Strategy 2. Questionnaires to schools/teachers, pupils and, eventually, to parents.** This strategy would emphasise the gathering of quantitative data regarding, for example, use and effects but also about the availability of data. To be really valid, this questionnaire must be administered to a representative sample of schools, teachers or pupils, but for the purposes of this pilot exercise, this universe could be restricted to a small territory such as a medium size city or community.

- **Strategy 3. Combination of 1 and 2.** This is the most comprehensive and has the benefit of providing both quantitative information regarding DLR availability, use and possibly effects, and also qualitative insights in relation to the factors that contribute to DLR development and use or limit them.

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3.   This is, for example, the way in which OECD deals with a similarly complex issue as innovation in firms and industries, with a combination of proxy data (such as patents) and questionnaires addressed either to a sample of stakeholders (including for example governmental agencies, chambers of commerce, trade unions, and so on) or to a statistically representative sample of firms.